

FIG. 1

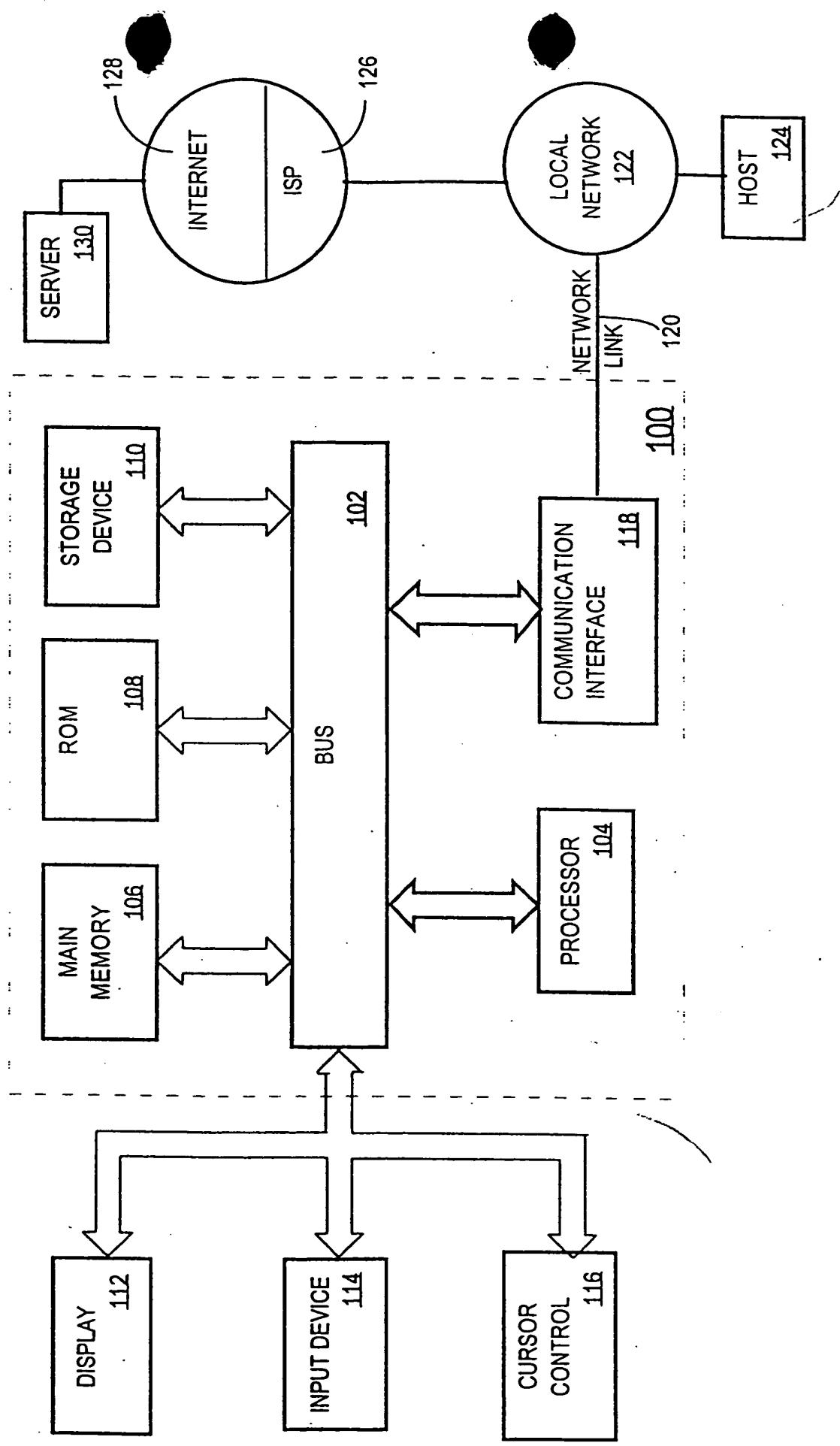


FIG. 2

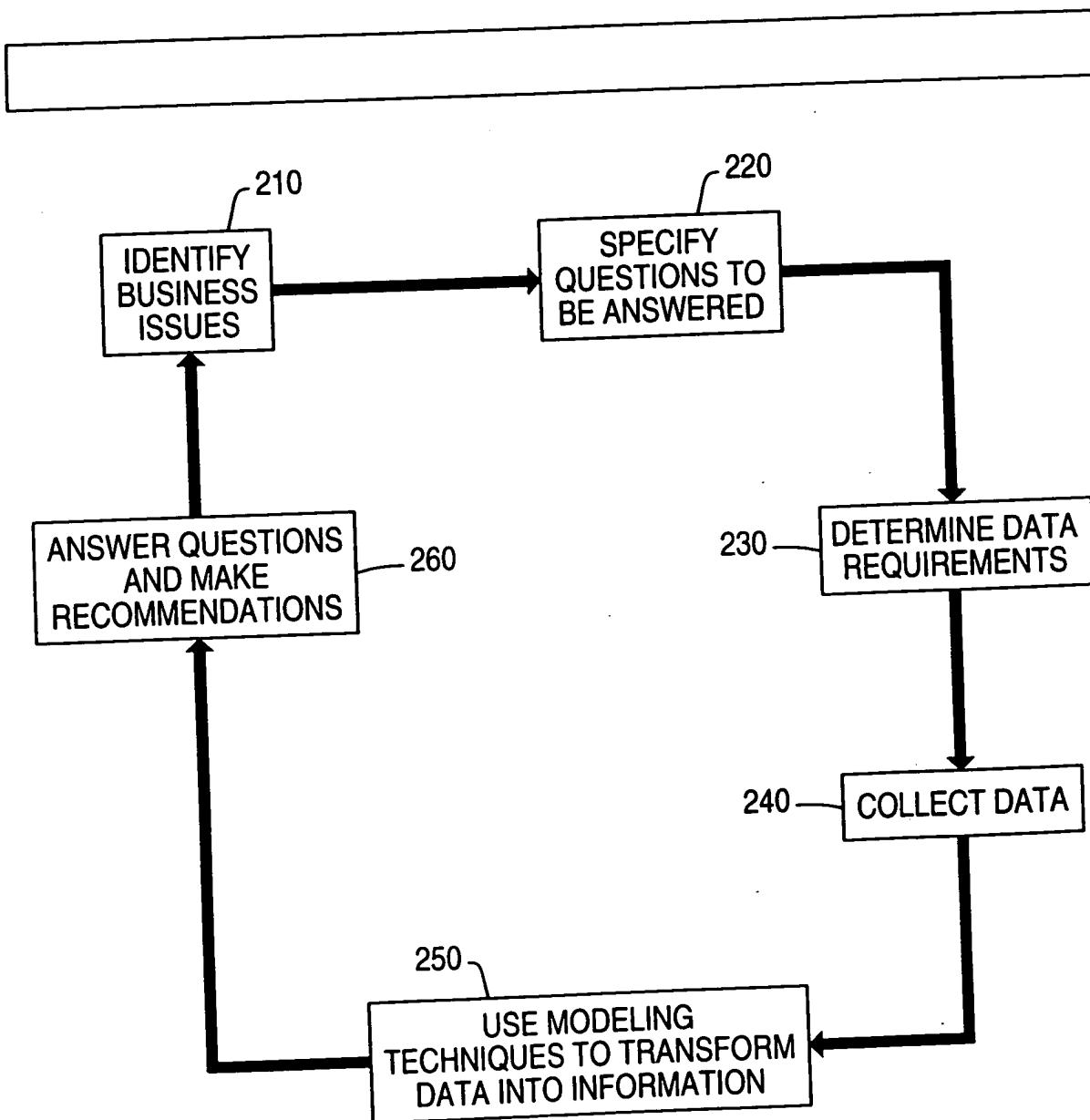
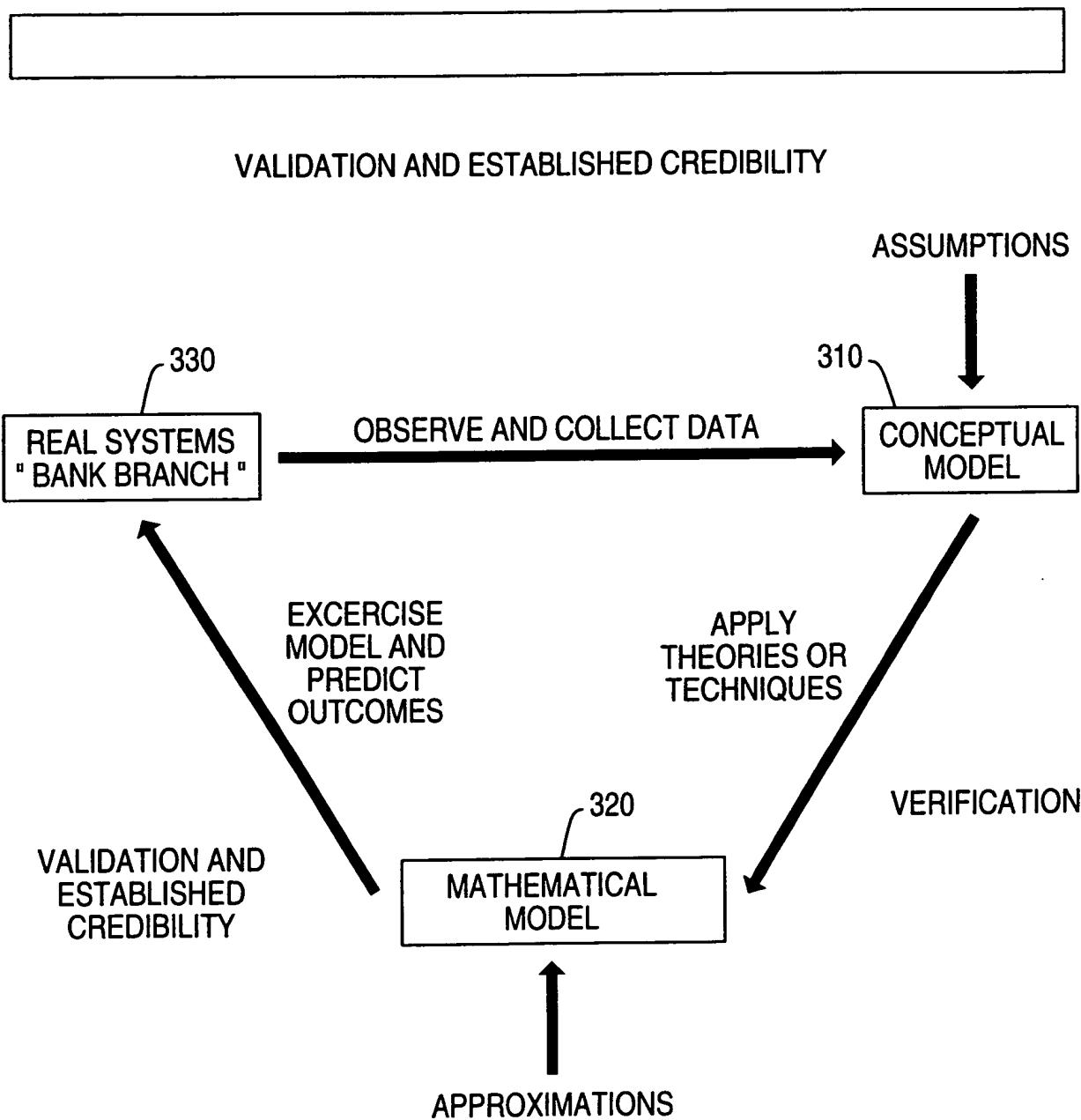


FIG. 3



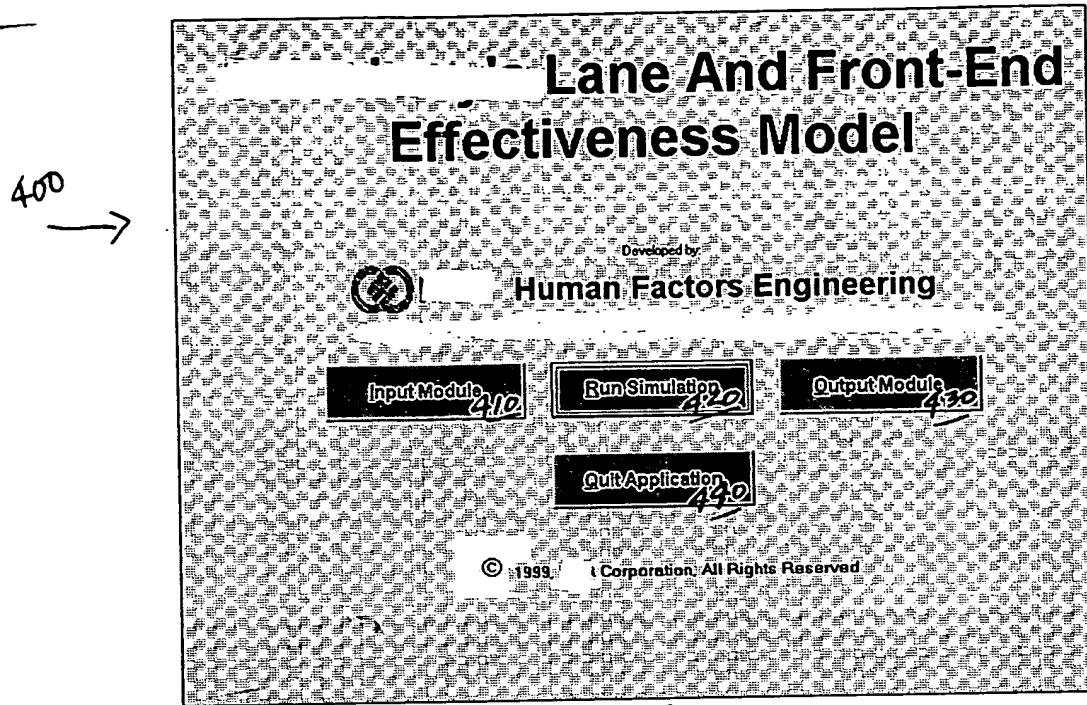


FIG. 4

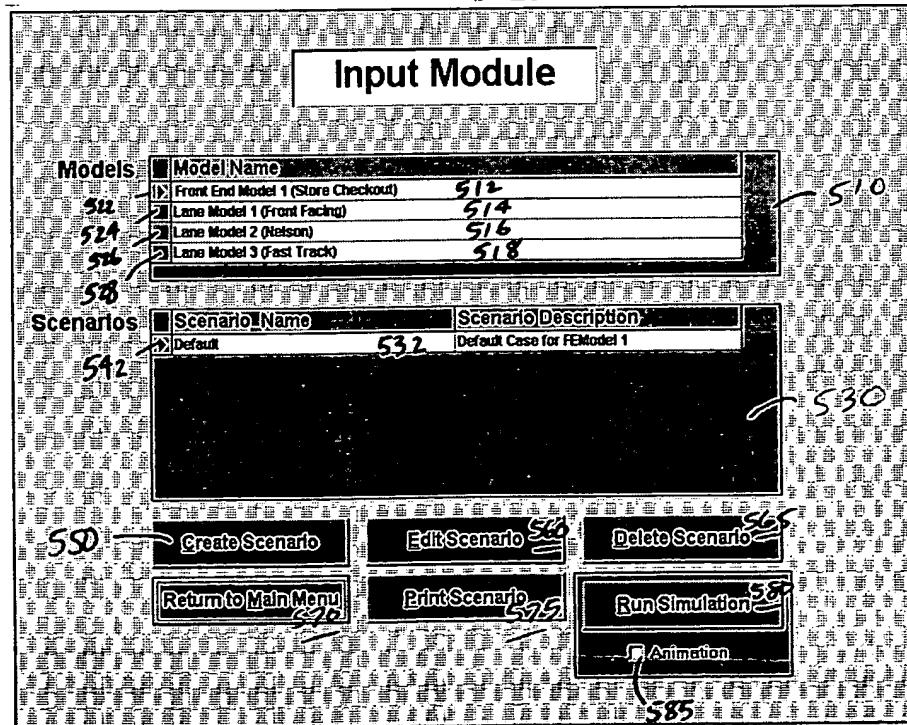


FIG. 5

600

Create Parameter File

Model Name: Front End Model 1 (Store Checkout)

610 Please Select the Scenario You Want to Clone 650

Scenario Name	Scenario Description
Default	Default Case for FEModel 1

Please Type Scenario Name and Description in the Text Boxes Below

Scenario Name 620 **Scenario Description** 630

Test 1 Add 4 checkstands: 1 Express & 3 Regular

610 Create and Return **615 Return Without Creating**

FIG. 6

100

Input Module

Models

722	Model Name	712
724	Front End Model 1 (Store Checkout)	714
726	Lane Model 1 (Front Facing)	716
728	Lane Model 2 (Nelson)	718
	Lane Model 3 (Fast Track)	

Scenarios

722	Scenario Name	732
724	Default	Default Case for FEModel 1
726	Test 1	Add 4 Checkstands: 1 Express & 3 Regular

750

750 Create Scenario **760 Edit Scenario** **760 Delete Scenario**

770 Return to Main Menu **775 Print Scenario** **780 Run Simulation**

785 Animation

FIG. 7

Edit Parameter File

Model: Front End Model 1 (Store Checkout) Scenario: Test 1
Name: Name:

Parameter Categories			
822 Transaction Finalization	801 Transaction Finalization	823 Transaction Beginning	828 Transaction Intervention
Configuration	Customer Demand	Schedules	Model Parameters
800	845	821	826

Lane Type	Parameter	Value	Range	Description
P	Start time of the simulation scenario (hours)	6	0 to 24 (hours)	Start time of the simulation scenario in hour from midnight
E	End time of the simulation scenario (hours)	23	0 to 24 (hours)	End time of the simulation scenario in hours from midnight. End time must be greater than Start time
R	Number of Fast-Track lanes	1	0 to 47	Number of Fast-Track lanes at the front-end. The total number of all lanes cannot exceed 48
All	Number of Express lanes	3	0 to 47	Number of Express lanes at the front-end. The total number of all lanes cannot exceed 48
All	Number of Regular lanes	13	1 to 48	Number of Regular lanes at the front-end. The total number of all lanes cannot exceed 48

Return to Input Form

Edit Parameter File

Model: Lane Model 2 (Nelson) Scenario: Default
Name: Name:

Parameter Categories			
922 Transaction Finalization	921 Transaction Finalization	923 Transaction Beginning	928 Bagging
Configuration	Customer Demand	Model Parameters	Intervention
900	945	921	910

Lane #	Parameter	Value	Range	Description
1	Time length of scenario	60	0.0 to 1440.0 (minutes)	Length of the simulation scenario in minutes
2	Number of baggers	1	0, 1, or 2	Number of baggers; options are 0 baggers, 1 bagger for both lanes, or 2 baggers - one for each lane
All	Maximum number of items on front belt	20	1 to 200	Maximum number of items on front belt
All	Maximum number of items in bagging area	20	1 to 200	Maximum number of items on back belt and bagging area
All	Probability of basket icon	0.5	0.0 to 1.0	Probability a customer uses a basket (vs. cart) when their

Return to Input Form

FIG. 8

FIG. 9

Arrival Rate Schedule

Time Interval	Number of Arrivals
4:46 AM - 5:00 AM	0
5:01 AM - 5:15 AM	0
5:16 AM - 5:30 AM	0
5:31 AM - 5:45 AM	0
5:46 AM - 6:00 AM	0
6:01 AM - 6:15 AM	4
6:16 AM - 6:30 AM	12
6:31 AM - 6:45 AM	8
6:46 AM - 7:00 AM	20
7:01 AM - 7:15 AM	28
7:16 AM - 7:30 AM	20
7:31 AM - 7:45 AM	24
7:46 AM - 8:00 AM	28

Enter the number of arrivals per hour in each 15-minute time interval.

Print Schedule Return to Edit Form

1000 →
1060 1065
1010 ←
1015

FIG. 10

Average Basket Sizes

Time Interval	Avg Basket Size
12:01 AM - 12:15 AM	0
12:16 AM - 12:30 AM	0
12:31 AM - 12:45 AM	0
12:46 AM - 1:00 AM	0
1:01 AM - 1:15 AM	0
1:16 AM - 1:30 AM	0
1:31 AM - 1:45 AM	0
1:46 AM - 2:00 AM	0
2:01 AM - 2:15 AM	0
2:16 AM - 2:30 AM	0
2:31 AM - 2:45 AM	0
2:46 AM - 3:00 AM	0
3:01 AM - 3:15 AM	0

1100 →
1160 1165
1110 ←
1115

Print Basket Sizes Return to Edit Form

FIG. 11

Schedules

Super Hobos 1220	1225 Beggars	1230 AI Personnel
Regular Cashiers 1235	1240 Express Cashiers	1245 Fast Track Cashiers

Time Interval	Regular Cashiers
12:01 AM - 12:30 AM	0
12:31 AM - 1:00 AM	0
1:01 AM - 1:30 AM	0
1:31 AM - 2:00 AM	0
2:01 AM - 2:30 AM	0
2:31 AM - 3:00 AM	0
3:01 AM - 3:30 AM	0
3:31 AM - 4:00 AM	0
4:01 AM - 4:30 AM	0
4:31 AM - 5:00 AM	0
5:01 AM - 5:30 AM	0
5:31 AM - 6:00 AM	0
6:01 AM - 6:30 AM	2
6:31 AM - 7:00 AM	2
7:01 AM - 7:30 AM	3
7:31 AM - 8:00 AM	3
8:01 AM - 8:30 AM	3

[Print Schedules](#)
 [Return to Edit Form](#)

1260 1265

FIG. 12

Delete Parameter File

Model Name	Front End Model 1 (Store Checkout)
Scenario Name	Default

[Delete and Return](#)
 [Return Without Deleting](#)

1360 1365

FIG. 13

Scalar Input Values

February 24, 1999

Input Parameters For Front End Model 1(Store Checkout)

Scenario Name: Default

Scenario Description: Default Case For FEM

Parameter	Value	Range	Description
Start time of the simulation scenario (hours)	6	0 to 24 (hours)	Start time of the simulation scenario in hours from midnight. Start time must be less than End time.
End time of the simulation scenario (hours)	23	0 to 24 (hours)	End time of the simulation scenario in hours from midnight. End time must be greater than Start time.
Number of Fast-Track lanes	1	0 to 47	Number of Fast-Track lanes at the front-end. The total number of all lanes (Fast-Track+Express+Regular) cannot exceed 48.
Number of Express lanes	3	0 to 47	Number of Express lanes at the front-end. The total number of all lanes (Fast-Track+Express+Regular) cannot exceed 48.
Number of Regular lanes	13	1 to 48	Number of Regular lanes at the front-end. Must be at least 1 Regular lane. The total number of all lanes (Fast-Track+Express+Regular) cannot exceed 48.

FIG. 14

Run Simulation Module

Models

Model Name
Front End Model 1 (Store Checkout) 1512
Lane Model 1 (Front Facing) 1514
Lane Model 2 (Nelson) 1516
Lane Model 3 (Fast Track) 1518

Scenarios

Scenario Name	Scenario Description
Default 1532	Default Case for FEM Model 1
Test 1 1534	Add 4 Checkstands: 1 Express & 3 Regular

Buttons

- Return to Main Menu 1570
- Print Scenario 1575
- Run Simulation 1580
- Animation 1585

FIG. 15

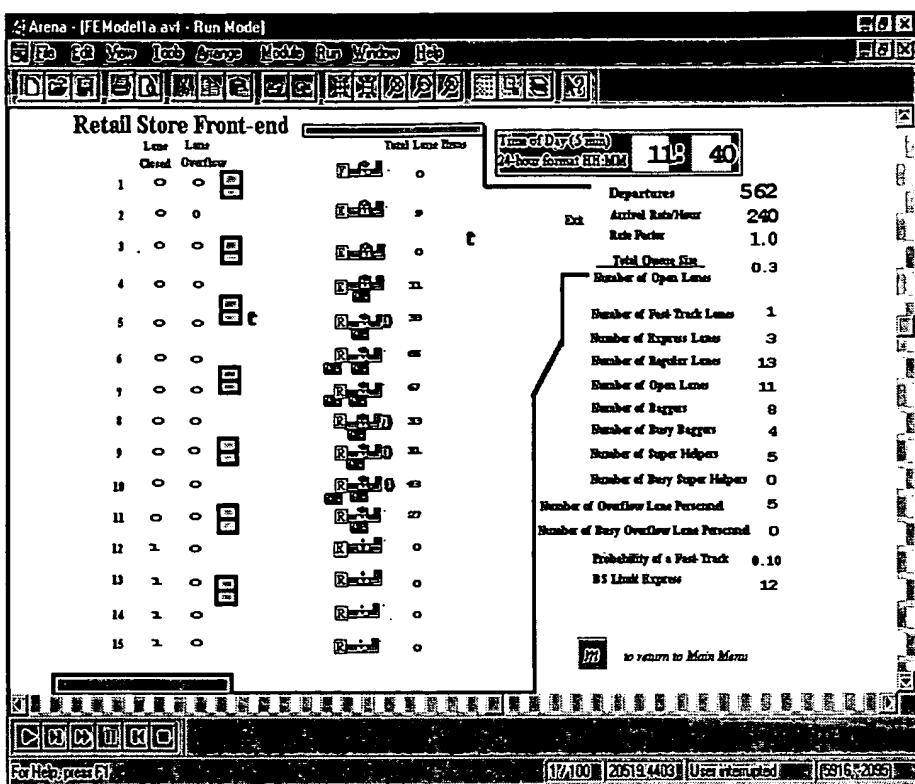


FIG. 16

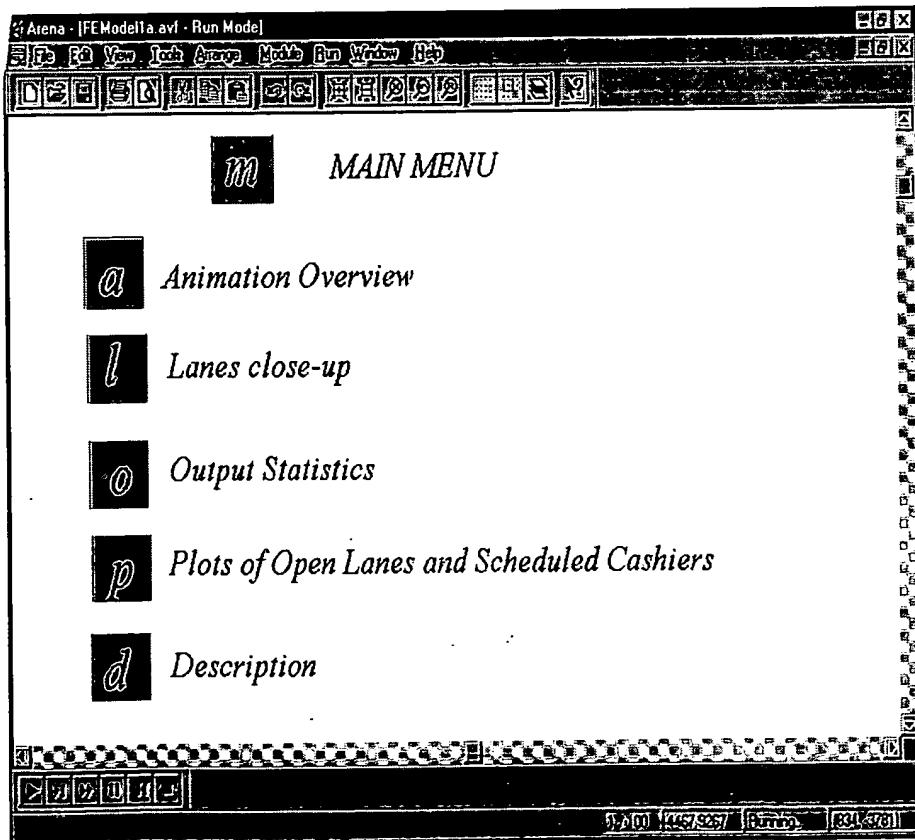


FIG. 17

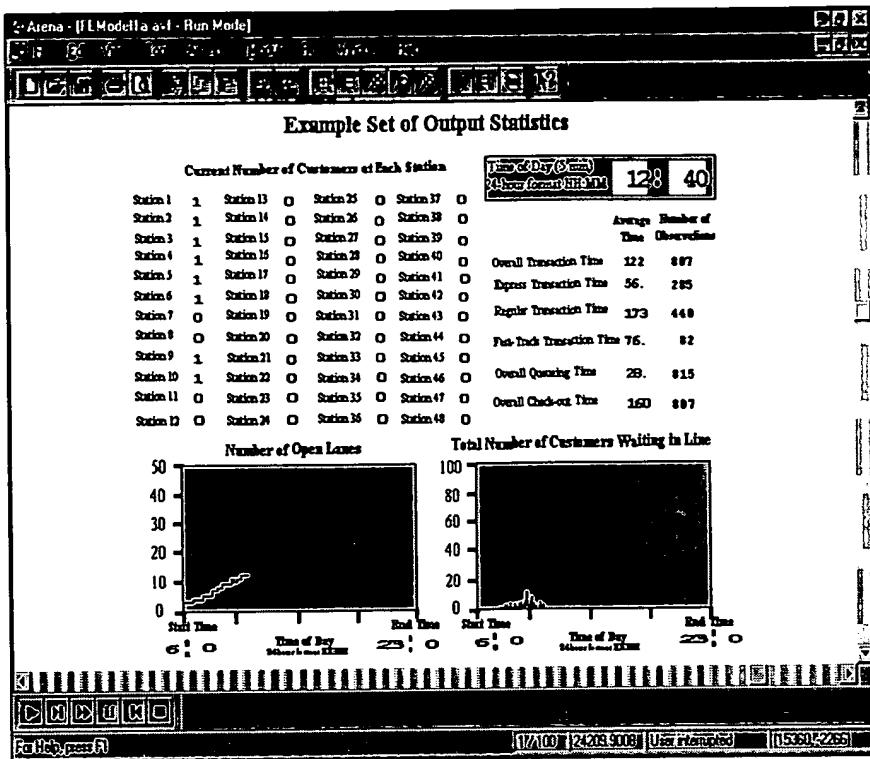


FIG. 18

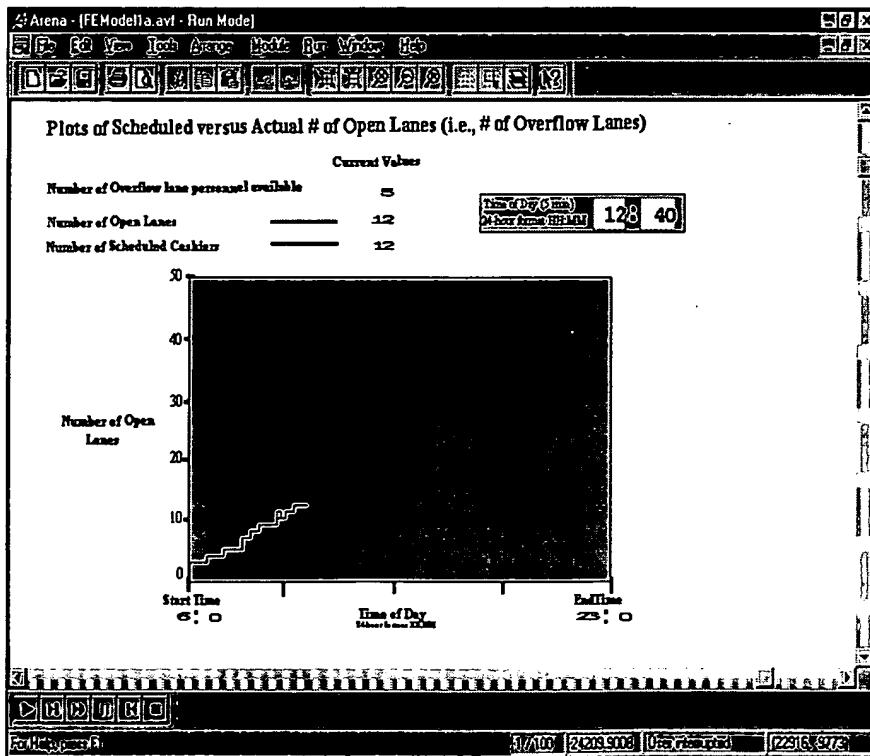


FIG. 19

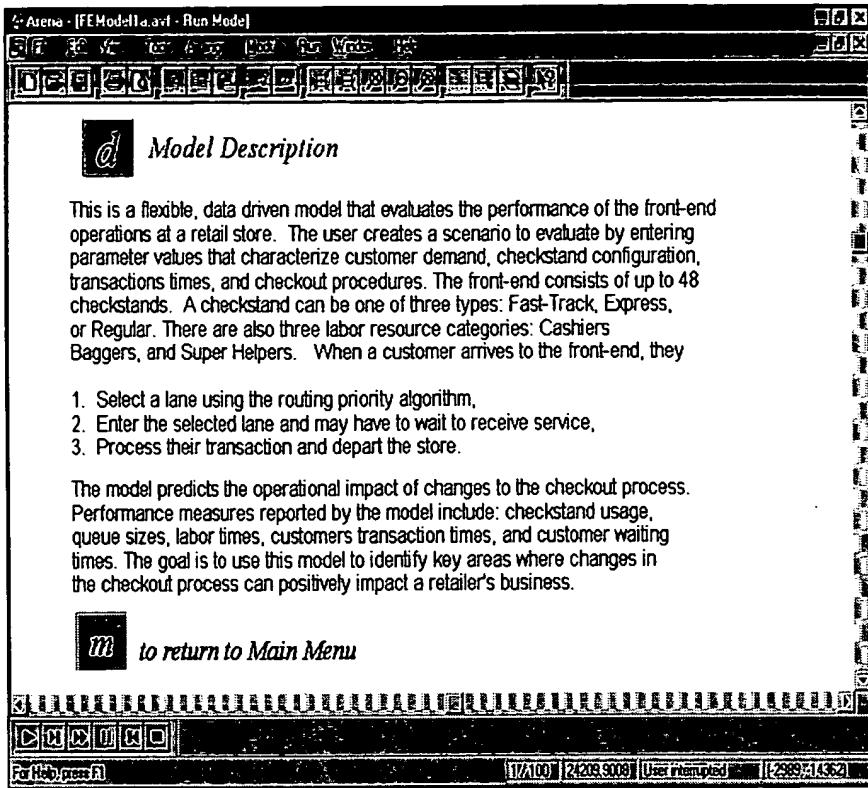


FIG. 20



FIG. 21

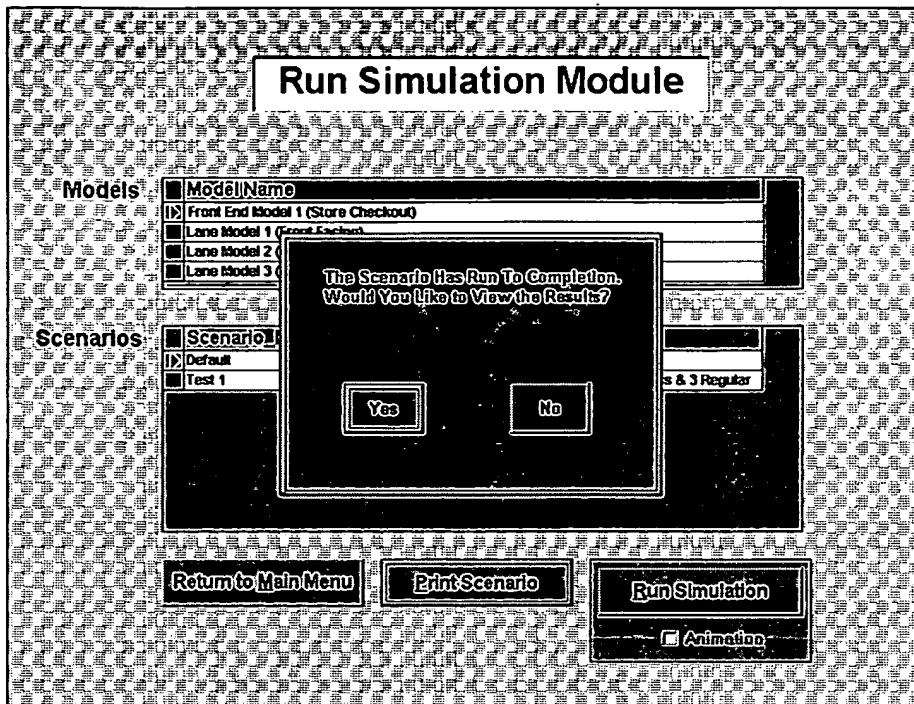


FIG. 22

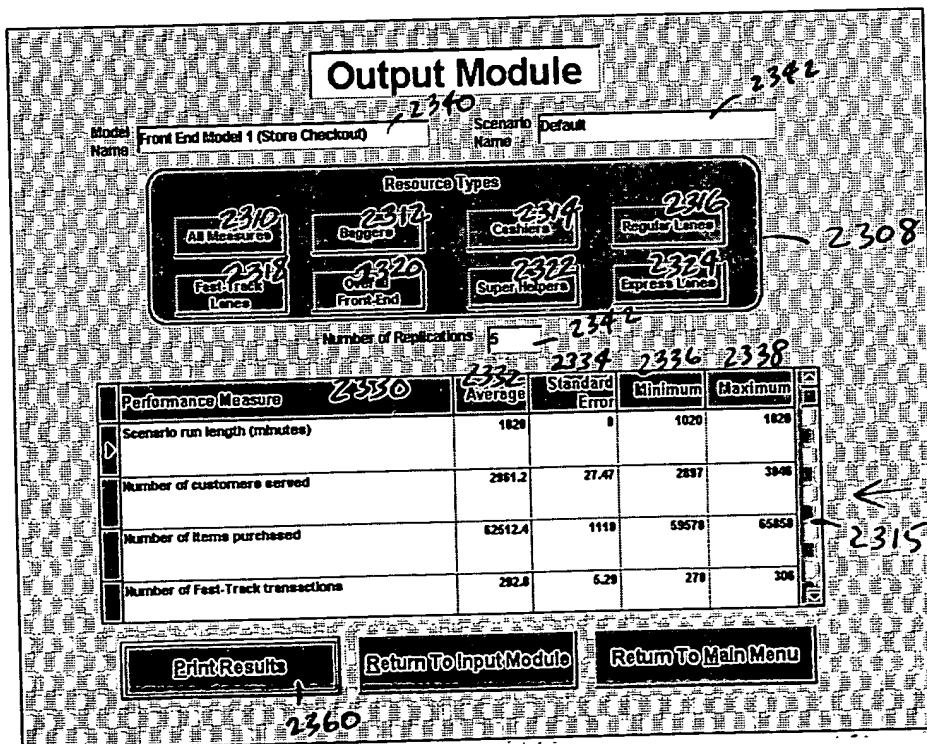


FIG. 23

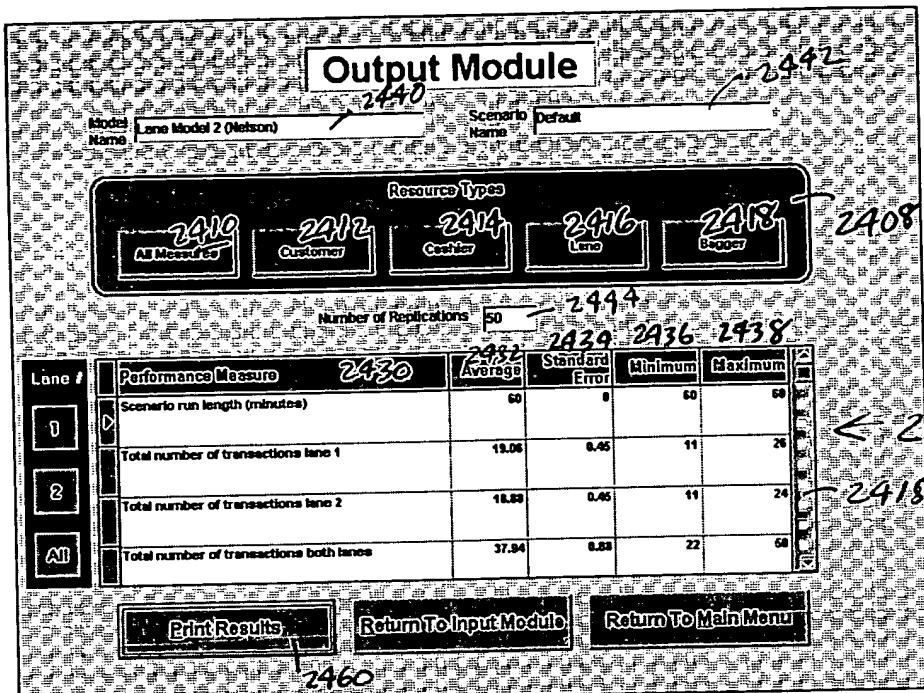


FIG. 24

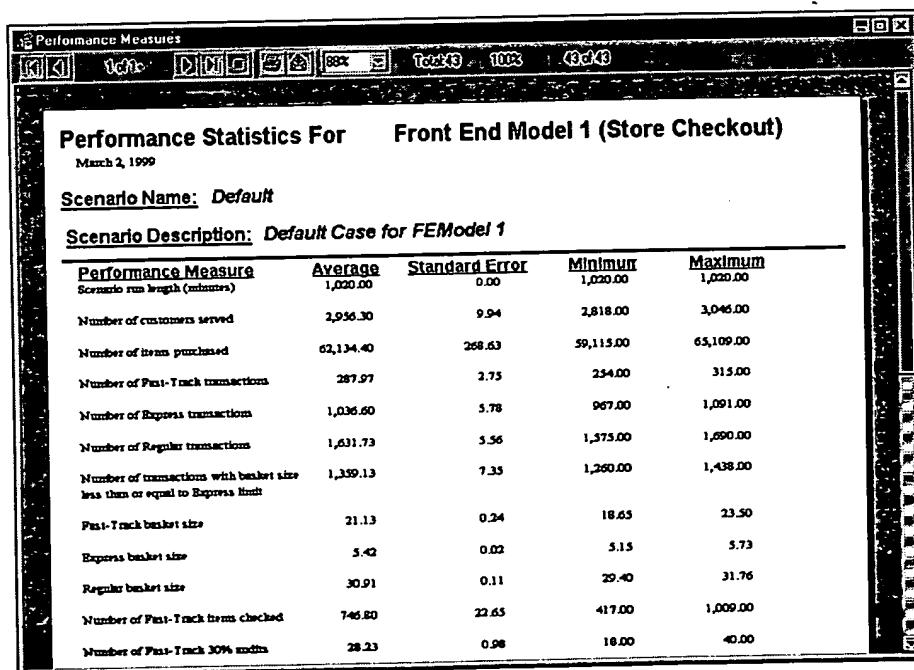


FIG. 25

Performance Measures

March 2, 1999

Scenario Name: Default

Scenario Description: Default Case for LaneM2

Performance Measure	Average	Standard Error	Minimum	Maximum	Lane #
Scenario run length (minutes)	60.00	0.00	60.00	60.00	0
Total number of transactions lane 1	19.06	0.45	11.00	26.00	1
Total number of transactions lane 2	18.88	0.45	11.00	24.00	2
Total number of transactions both lanes	37.94	0.88	22.00	50.00	0
Total number of items lane 1	280.10	11.84	112.00	445.00	1
Total number of items lane 2	287.88	10.15	123.00	421.00	2
Total number of items both lanes	567.98	18.02	258.00	659.00	0
Queue size lane 1	0.88	0.14	0.00	5.71	1
Queue size lane 2	0.82	0.11	0.00	3.71	2
Queue size both lanes	1.50	0.24	0.16	9.35	0

71G.26

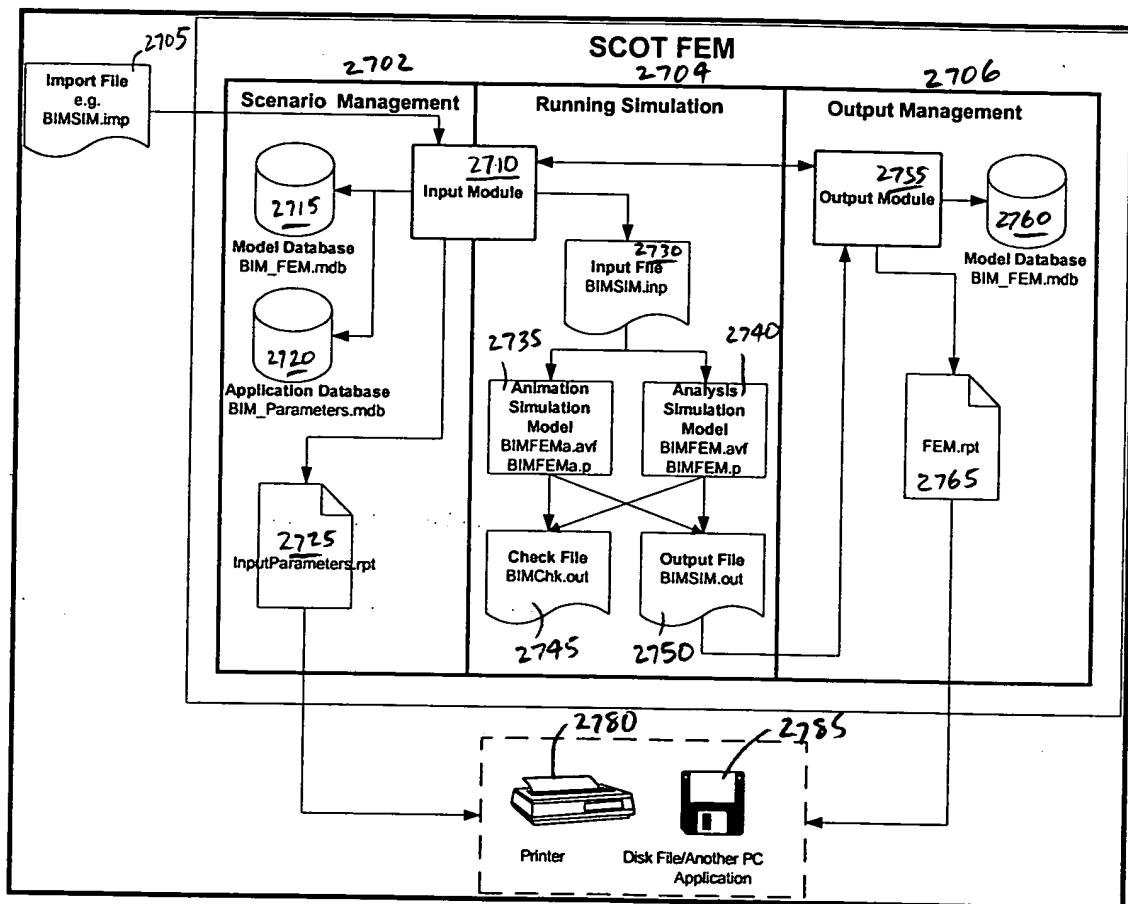


FIG. 27 SCOTFEM Process Flow Diagram

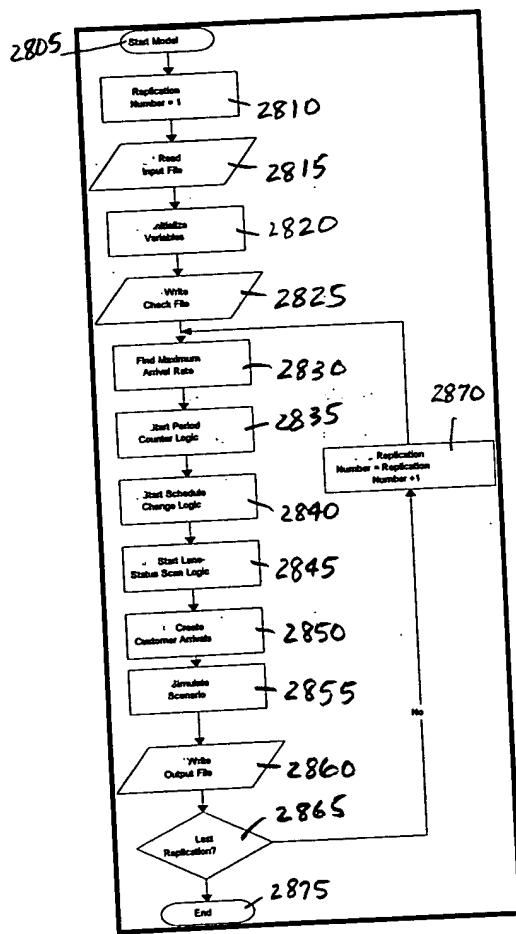


FIG. 28 Simulation Process

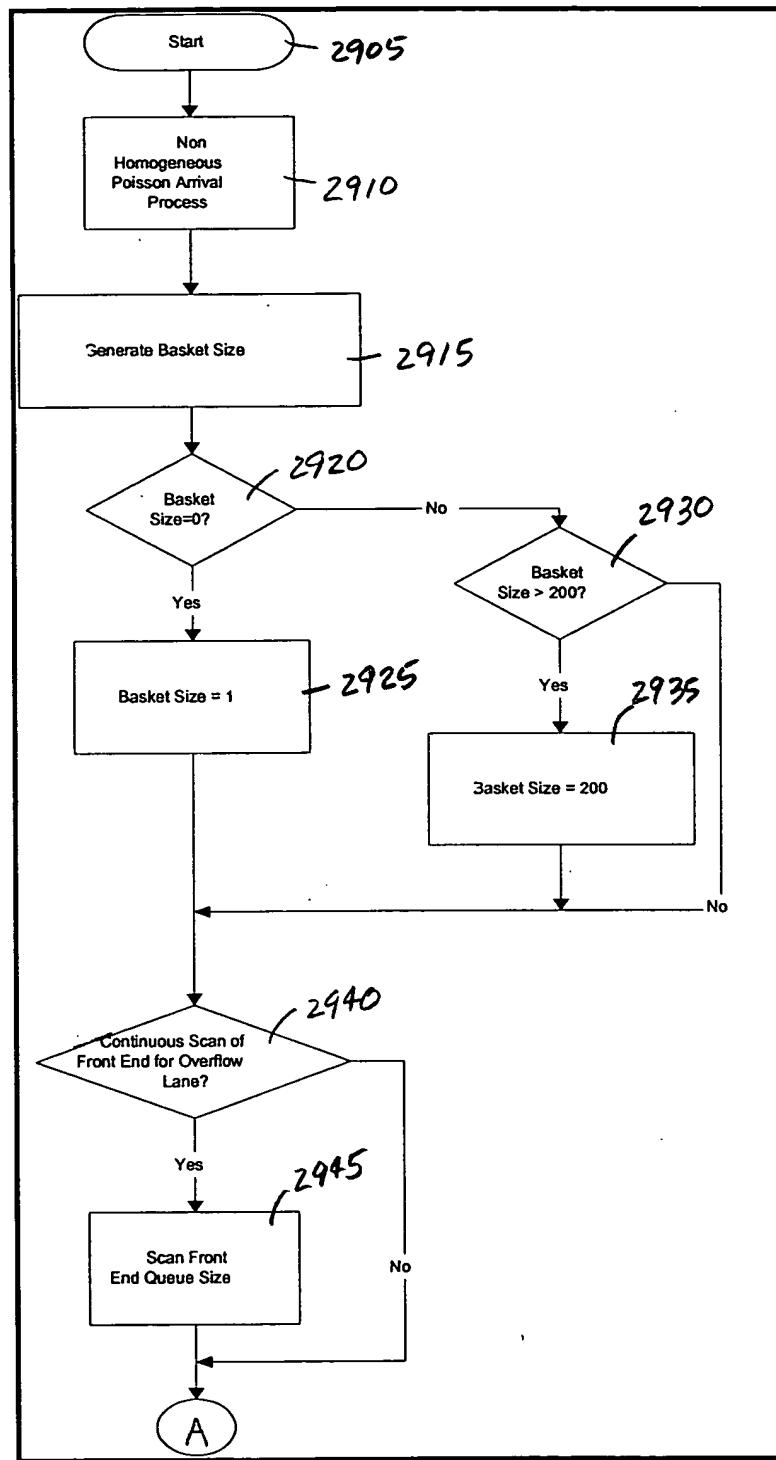


FIG 29 Customer Flow Process

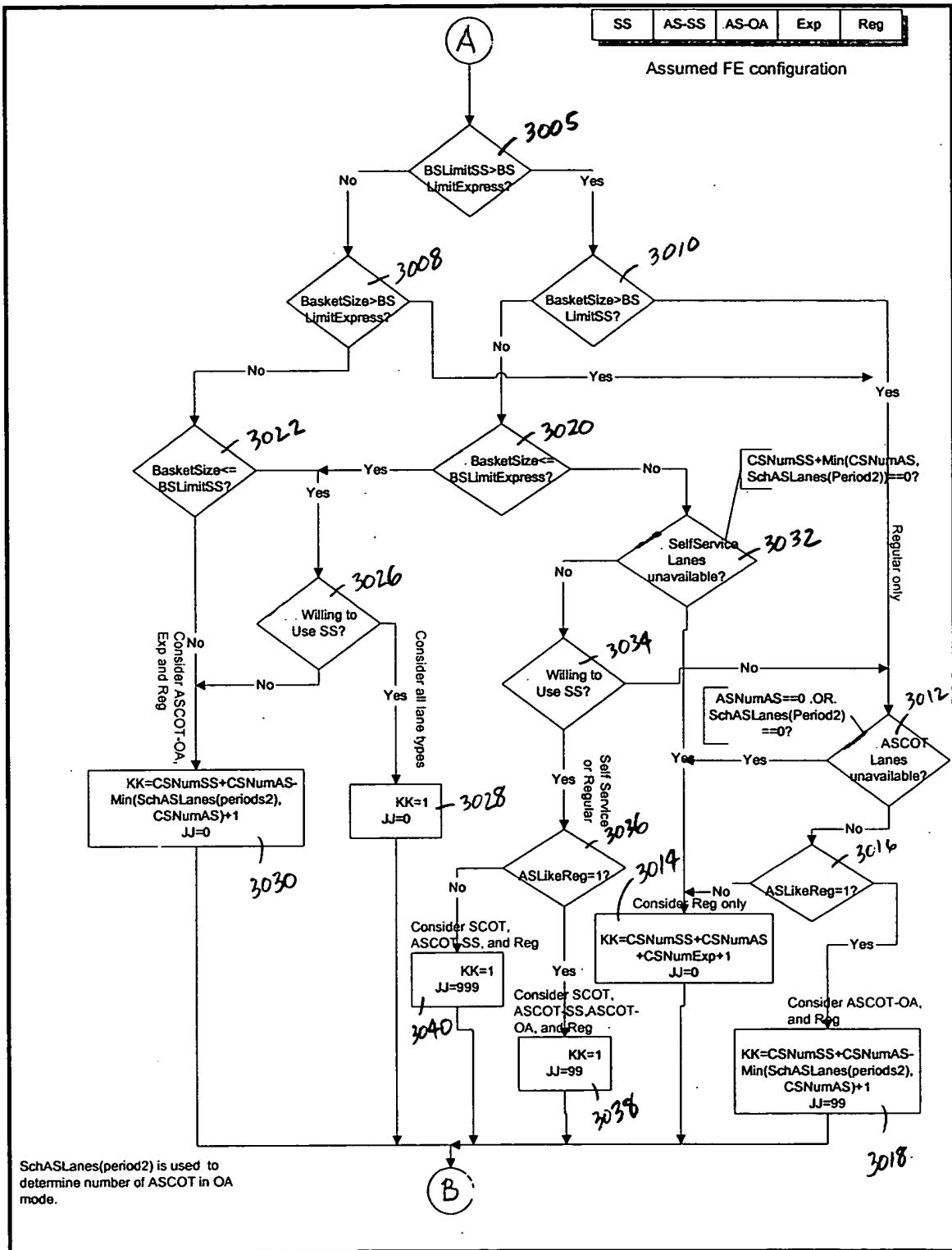


FIG 30 Choose Lane Logic

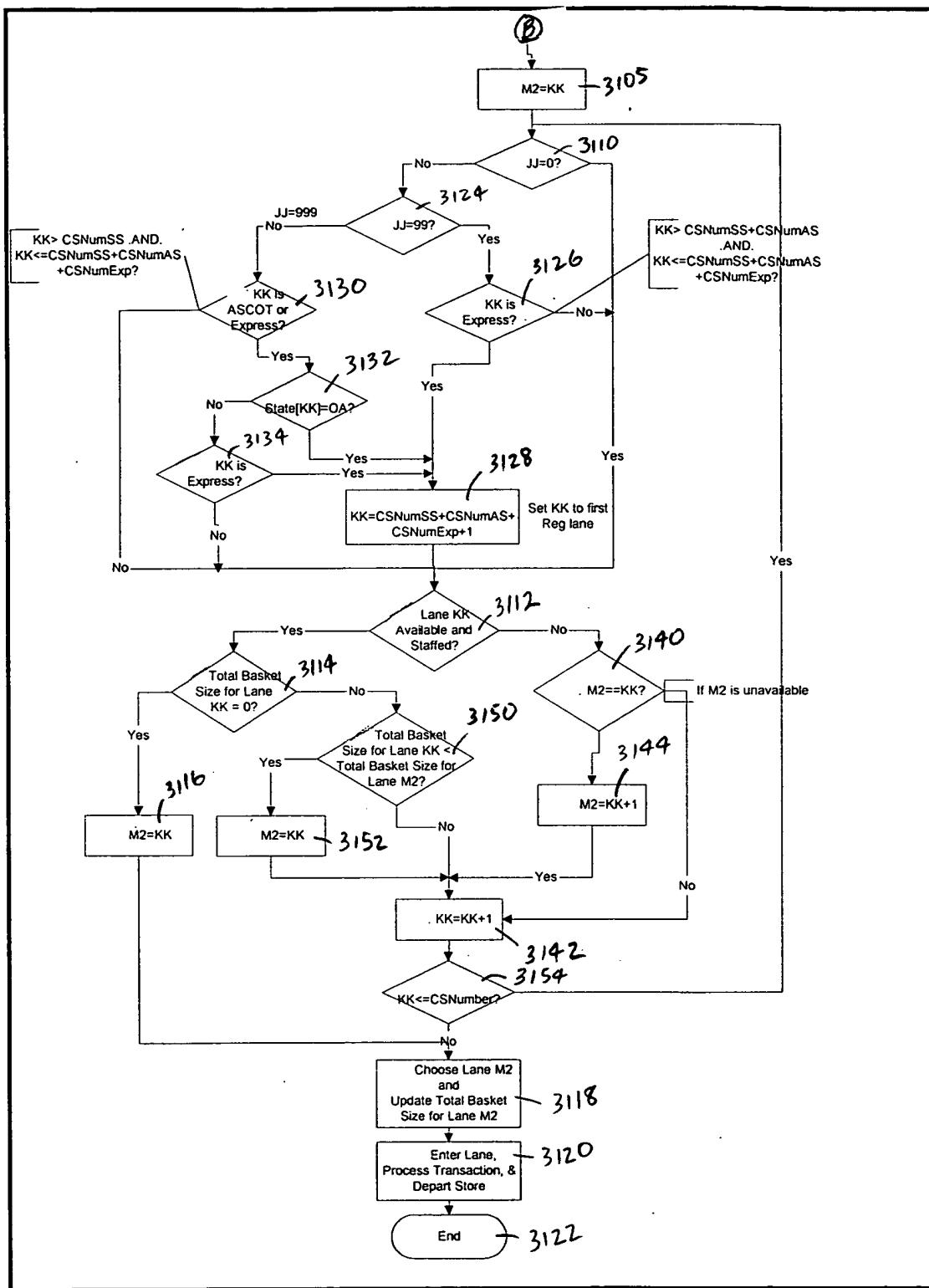


FIG 31 Choose Lane Logic - Continued

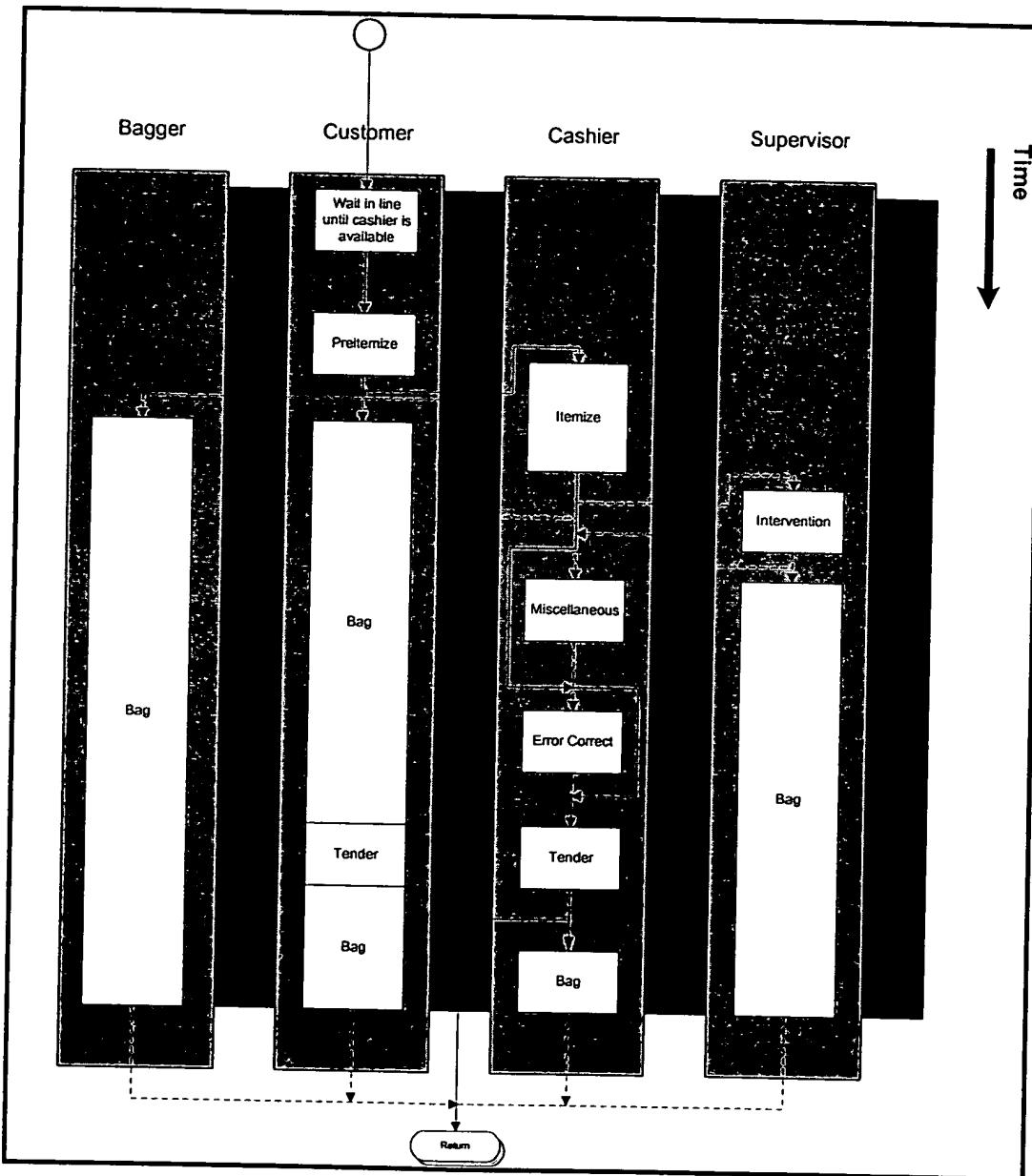


FIG 32 Transaction Process for Cashier Operated Lanes

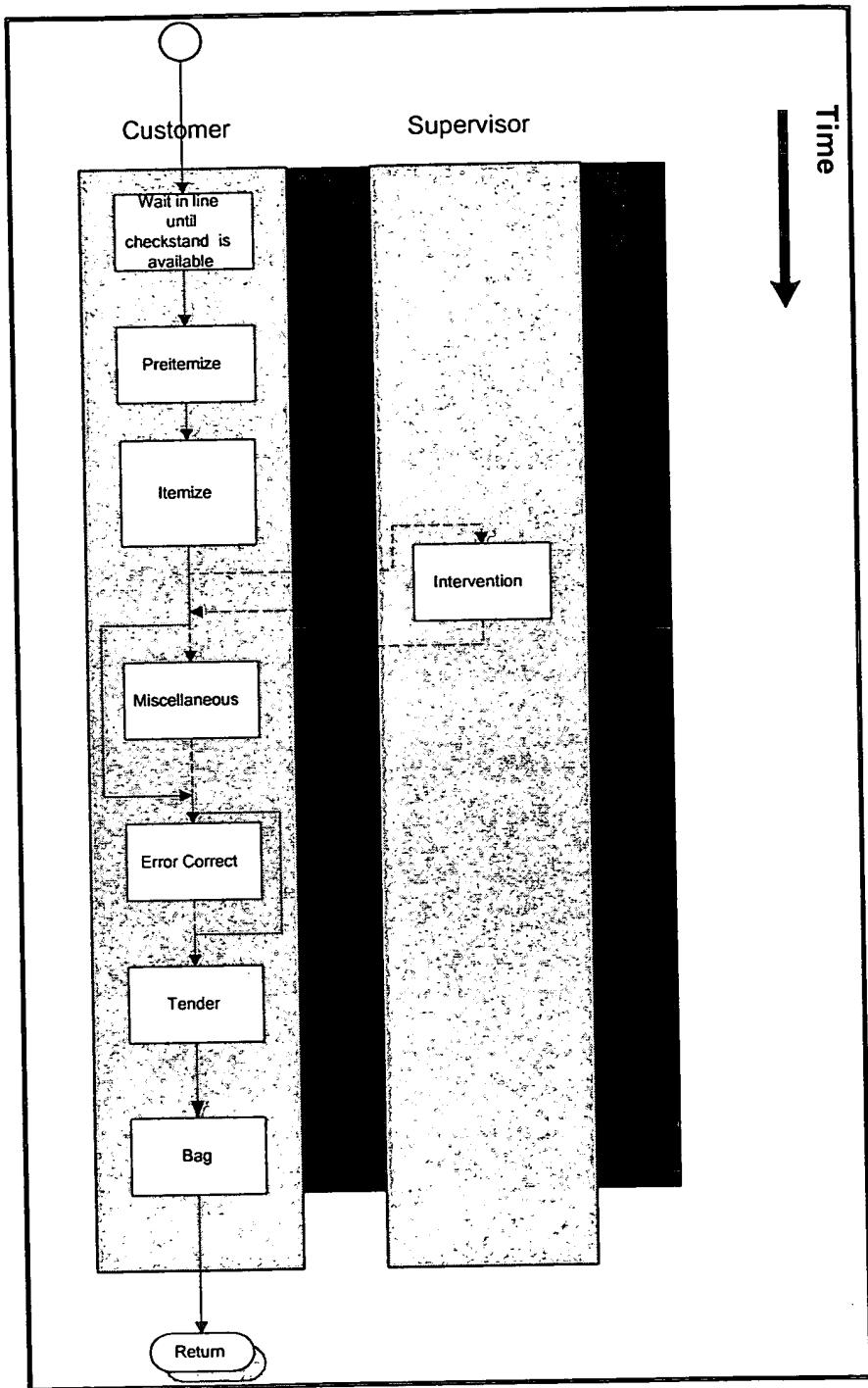


FIG 33 Transaction Process for Self-service Lanes